

AMENDMENTS TO THE CLAIMS

1. (cancelled) A programmable logic controller comprising:
- a single chip micro controller;
 - internal RAM that is internal to said single chip micro controller; and
 - internal re-programmable read only memory that is internal to said single chip micro controller, the internal re programmable memory being used to store a user program for actualizing programmable logic controller functions.
2. (cancelled) A programmable logic controller program for directing a programmable logic controller, comprising:
- a user program; and
 - system sequencing and coordination instructions necessary to operate said programmable logic controller, wherein said user program and system sequencing and coordination instructions are compiled together into a single executable firmware module of said programmable logic controller within a single chip, requiring no external operating system.
3. (cancelled) A programmable logic controller system, comprising:
- within a single chip, a program execution device having a re-programmable memory whose function is limited to program execution of a programmable logic controller within said single chip; and
 - a separable communication/programming device, which provides the programmability function, wherein said communication/programming device provides in a separable package all functions required for external communication and conversion of a user program for controlling said programmable logic controller from symbolic form to

binary code, and loading of that code into said program execution device and wherein said binary code is programmed into said re-programmable memory of said program execution device by direct manipulation of logic controls of said re-programmable memory.

4. (new) An apparatus comprising:

a programmable logic controller lacking instructions to convert a user program from a symbolic form to a binary form, said programmable logic controller comprising:

a single chip program execution device comprising:

a micro controller operable to implement programmable logic controller I/O functions upon executing a compilation comprising the user program and a system support kernel; and

a re-programmable read only memory within which the compilation is stored,

said single chip program execution device separable from a communication/programming device adapted to compile the user program and the system support kernel, said programmable logic controller lacking a memory device external to said single chip program execution device.

5. (new) A method comprising:

receiving a symbolic user program at a communication/programming device, said communication/programming device separable from a single chip program execution device having a re-programmable read only memory, said single chip program execution device adapted to execute a binary programmable logic controller program, said binary programmable logic controller program stored within said re-programmable memory, said binary programmable logic control program adapted to operate a programmable logic controller, said programmable logic controller lacking a memory device external to said

single chip program execution device; and

compiling, at said communication/programming device, said symbolic user program with a system support kernel to form said binary programmable logic control program.

6. (new) The method of claim 5, comprising:

providing said binary programmable logic control program to said single chip program execution device.

7. (new) A method comprising:

receiving, from a communication/programming device, a binary programmable logic control program at a single chip program execution device having a re-programmable read only memory, said communication/programming device separable from said single chip program execution device, said binary programmable logic control program a compilation of a symbolic user program and a system support kernel, said single chip program execution device adapted to execute said binary programmable logic controller program to operate a programmable logic controller, said programmable logic controller lacking a memory device external to said single chip program execution device; and

loading said binary programmable logic control program into said re-programmable read only memory of said program single chip execution device.

8. The method of claim 7, further comprising:

executing said binary programmable logic control program on a micro controller of said single chip program execution device.

9. (new) A programmable logic controller system, comprising:

within a single chip, a program execution device having a re-programmable

memory, said program execution device adapted to execute a binary programmable logic controller program, said binary programmable logic controller program stored within said re-programmable memory, said binary programmable logic controller program comprising a compilation of a user program and a system support kernel, said binary programmable logic control program adapted to operate a programmable logic controller, said programmable logic controller lacking a memory device external to said single chip program execution device; and

bl a communication/programming device separable from said program execution device, said communication/programming device providing functions required for external communication and compilation of said binary programmable logic controller program and loading of said binary programmable logic controller program into said re-programmable memory and wherein said binary programmable logic controller program is stored in said re-programmable memory of said program execution device by direct manipulation of logic controls of said re-programmable memory.

10. (new) The programmable logic controller system according to claim 9, further comprising:
a watchdog timer.

11. (new) A machine-readable medium storing instructions for activities comprising:

receiving a symbolic user program at a communication/programming device, said communication/programming device separable from a single chip program execution device having a re-programmable read only memory, said single chip program execution device adapted to execute a binary programmable logic controller program, said binary programmable logic controller program stored within said re-programmable memory, said binary programmable logic control program adapted to operate a programmable logic controller, said programmable logic controller lacking a memory device external to said

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single chip program execution device; and

compiling, at said communication/programming device, said symbolic user program
with a system support kernal to form said binary programmable logic control program.
